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L3: Entry 1 of 2 File: USPT Apr 13, 2004

US-PAT-NO: 6720485
DOCUMENT-IDENTIFIER: US 6720485 B1

TITLE: Controlling starch synthesis

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWMC | Drawi De

☐ 2. Document ID: US 5817913 A

L3: Entry 2 of 2 File: USPT Oct 6, 1998

US-PAT-NO: 5817913
DOCUMENT-IDENTIFIER: US 5817913 A

TITLE: Method for breeding tomatoes with superior taste characteristics and product of the method

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWMC | Drawi De

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L2       110219 (TOMATO OR LYCOPERSICON)

=> s L1 and L2
L3           64 L1 AND L2

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L4   ANSWER 1 OF 33  BIOSIS  COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN
ACCESSION NUMBER:   2004:257625  BIOSIS
DOCUMENT NUMBER:    PREV200400257427
TITLE:              Controlling starch synthesis.
AUTHOR(S):            ***Schaffer, Arthur***   [Inventor, Reprint Author];
                    Levin, Ilan [Inventor]; Petreikov, Marina [Inventor]; Bar,
                    Moshe [Inventor]
CORPORATE SOURCE:   Hashmonaim, Israel
                    ASSIGNEE: State of Israel-Ministry of Agriculture, Beit
                    Dagan, Iceland
PATENT INFORMATION: US 6720485 April 13, 2004
SOURCE:             Official Gazette of the United States Patent and Trademark
                    Office Patents, (Apr 13 2004) Vol. 1281, No. 2.
                    http://www.uspto.gov/web/menu/patdata.html. e-file.
                    ISSN: 0098-1133 (ISSN print).
DOCUMENT TYPE:      Patent
LANGUAGE:           English
ENTRY DATE:         Entered STN: 12 May 2004
                    Last Updated on STN: 12 May 2004
AB   A method for controlling starch synthesis in tomatoes including providing
     a population of plants derived from interspecific crosses of
       ***Lycopersicon***   spp. with   ***Lycopersicon***   esculentum
     genotypes, and selecting individuals of the population that each contain
     an allele of a gene that increases starch synthesis, the gene originating
     from the   ***Lycopersicon***   spp.

L4   ANSWER 2 OF 33  CABA COPYRIGHT 2004 CABI on STN
ACCESSION NUMBER:          2004:55701  CABA
DOCUMENT NUMBER:           20043026024
TITLE:                     Cloning, expression and characterization of LeFRK3,
                           the fourth   ***tomato***   (  ***Lycopersicon***
                           esculentum Mill.) gene encoding fructokinase
AUTHOR:                    German, M. A.; Asher, I.; Petreikov, M.; Dai, N.;
                             ***Schaffer, A. A.***  ; Granot, D.
CORPORATE SOURCE:          Institute of Field and Garden Crops, Agricultural
                           Research Organization, The Volcani Center, Bet Dagan
                           50250, Israel. granot@agri.gov.il
SOURCE:                    Plant Science, (2004) Vol. 166, No. 2, pp. 285-291.
                           26 ref.
                           Publisher: Elsevier Science Ltd. Oxford
                           ISSN: 0168-9452
PUB. COUNTRY:              United Kingdom
DOCUMENT TYPE:             Journal
LANGUAGE:                  English
ENTRY DATE:                Entered STN: 20040402
                           Last Updated on STN: 20040402
AB   A full-length cDNA encoding a novel fourth fructokinase, LeFRK3, was
     cloned from green   ***tomato***   (  ***Lycopersicon***   esculentum
     Mill.) fruits. The putative protein shares 70, 65.5 and 69% amino acid
     homology with the three previously identified   ***tomato***
     fructokinases encoded by LeFRK1, LeFRK2 and LeFRK4, respectively. This
     fourth fructokinase has signature patterns of the pfkB family of
     carbohydrate kinases as well as substrate recognition sites and an
     ATP-binding domain. Confirmation for its fructokinase activity was
```

to phosphorylate or grow on either glucose or fructose as LeFRK3 complemented growth on fructose but not on glucose. Moreover, soluble crude protein extracts prepared from the transformed yeast cells revealed fructose but not glucose phosphorylation activity. In contrast to the LeFRK1 gene product which is inhibited neither by fructose nor by Mg, and to LeFRK2 gene product which is inhibited by both fructose and Mg, the LeFRK3 product is inhibited by fructose but not by Mg. Separation by HPLC-ion exchange chromatography pointed to the gene product of LeFRK3 as the protein responsible for the third peak of fructokinase activity (FKIII), sharing the same pattern of fructose inhibition previously identified with FKIII in ***tomato*** fruits. Mapping of ***tomato*** fructokinases indicated that LeFRK3 is located on chromosome 2, unlike LeFRK1 (chromosome 3), LeFRK2 (chromosome 6), and LeFRK4 (chromosome 10). The relative expression levels of the four known FRK genes in different ***tomato*** organs were analyzed by quantitative RT-PCR. LeFRK2 and LeFRK3 are the predominant genes expressed in all organs with LeFRK3 having the highest level of expression in leaves and apices. LeFRK4 is expressed only in stamens. This differential expression patterns combined with the different biochemical characteristics of the four FRK isozymes suggest that each plays a different role in plant development.

L4 ANSWER 3 OF 33 CABA COPYRIGHT 2004 CABI on STN DUPLICATE 1
ACCESSION NUMBER: 2003:132797 CABA
DOCUMENT NUMBER: 20033106461
TITLE: Suppression of fructokinase encoded by LeFRK2 in ***tomato*** stem inhibits growth and causes wilting of young leaves
AUTHOR: German, M. A.; Dai, N.; Matsevitz, T.; Hanael, R.; Petreikov, M.; Bernstein, N.; Ioffe, M.; Shahak, Y.; ***Schaffer, A. A.*** ; Granot, D.
CORPORATE SOURCE: Institute of Field and Garden Crops, Agricultural Research Organization, The Volcani Center, Bet Dagan 50250, Israel. granot@agri.huji.ac.il
SOURCE: Plant Journal, (2003) Vol. 34, No. 6, pp. 837-846. 36 ref.
Publisher: Blackwell Science. Oxford
ISSN: 0960-7412
PUB. COUNTRY: United Kingdom
DOCUMENT TYPE: Journal
LANGUAGE: English
ENTRY DATE: Entered STN: 20030812
Last Updated on STN: 20030812
AB Fructokinases catalyze the key step of fructose phosphorylation in plants. LeFRK2, the major fructokinase-encoding gene in ***tomato*** plants, is abundantly expressed in roots, stems, and fruits. To analyze the role of LeFRK2 in plant development, we analysed transgenic ***tomato*** plants with sense and antisense expression of StFRK, the potato homologue of LeFRK2. Increased fructokinase activity had no effect. However, plants in which LeFRK2 was specifically suppressed, either via antisense suppression or via co-suppression, exhibited growth inhibition and wilting of young leaves at daytime. Grafting experiments indicated that a stem interstock of antisense plants was sufficient to inhibit growth and cause leaf wilting. Stem secondary xylem exhibited particular suppression of LeFRK2 and the area of active xylem, estimated by eosin uptake, was significantly smaller in antisense stem compared to that of wild-type plants. These results suggest that LeFRK2 might be required for proper development of xylem that affected growth and wilting.

L4 ANSWER 4 OF 33 CABA COPYRIGHT 2004 CABI on STN DUPLICATE 2
ACCESSION NUMBER: 2003:44181 CABA
DOCUMENT NUMBER: 20033011860
TITLE: Cloning and functional expression of alkaline [alpha]-galactosidase from melon fruit: similarity to plant SIP proteins uncovers a novel family of plant glycosyl hydrolases
AUTHOR: Carmi, N.; Zhang GenFa; Petreikov, M.; Gao ZhiFang; Eyal, Y.; Granot, D.; ***Schaffer, A. A.*** ; Zhang, G. F.; Gao, Z. F.
CORPORATE SOURCE: Institute of Field and Garden Crops, ARO, Volcani Center, Bet Dagan 50250, Israel. vcaris@volcani.agri.gov.il
SOURCE: Plant Journal, (2003) Vol. 33, No. 1, pp. 97-106. 36 ref.
Publisher: Blackwell Science. Oxford
ISSN: 0960-7412

DOCUMENT TYPE: Journal
LANGUAGE: English
ENTRY DATE: Entered STN: 20030307
Last Updated on STN: 20030307

AB Raffinose and stachyose are ubiquitous galactosyl-sucrose oligosaccharides in the plant kingdom which play major roles, second only to sucrose, in photoassimilate translocation and seed carbohydrate storage. These sugars are initially metabolised by [alpha]-galactosidases ([alpha]-gal). We report the cloning and functional expression of the first genes, CmAGA1 and CmAGA2, encoding for plant [alpha]-gals with alkaline pH optima from melon fruit (Cucumis melo L.), a raffinose and stachyose translocating species. The alkaline [alpha]-gal genes show very high sequence homology with a family of undefined 'seed imbibition proteins' (SIPs) which are present in a wide range of plant families. In order to confirm the function of SIP proteins, a representative SIP gene, from ***tomato*** , was expressed and shown to have alkaline [alpha]-gal activity. Phylogenetic analysis based on amino acid sequences shows that the family of alkaline [alpha]-gals shares little homology with the known prokaryotic and eukaryotic [alpha]-gals of glycosyl hydrolase families 27 and 36, with the exception of two cross-family conserved sequences containing aspartates which probably function in the catalytic step. This previously uncharacterized plant-specific [alpha]-gal family of glycosyl hydrolases, with optimal activity at neutral-alkaline pH likely functions in key processes of galactosyl-oligosaccharide metabolism, such as during seed germination and translocation of RFO photosynthate.

L4 ANSWER 5 OF 33 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 3
ACCESSION NUMBER: 2002:69240 AGRICOLA
DOCUMENT NUMBER: IND23297255
TITLE: LeFRK4, a novel ***tomato*** (***Lycopersicon*** esculentum Mill.) fructokinase specifically expressed in stamens.
AUTHOR(S): German, M.A.; Dai, N.; Chmelnitsky, I.; Sobolev, I.; Salts, Y.; Barg, R.; ***Schaffer, A.A.*** ; Granot, D.
AVAILABILITY: DNAL (QK1.P5)
SOURCE: Plant science, Sept 2002. Vol. 163, No. 3. p. 607-613
Publisher: Oxford, UK : Elsevier Science Ltd.
CODEN: PLSCE4; ISSN: 0168-9452
NOTE: Includes references
PUB. COUNTRY: Ireland
DOCUMENT TYPE: Article
FILE SEGMENT: Non-U.S. Imprint other than FAO
LANGUAGE: English

L4 ANSWER 6 OF 33 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 4
ACCESSION NUMBER: 2002:69234 AGRICOLA
DOCUMENT NUMBER: IND23297249
TITLE: The ***tomato*** hexokinase LeHXK1 cloning, mapping, expression pattern and phylogenetic relationships.
AUTHOR(S): Dai, N.; Kandel-Kfir, M.; Petreikov, M.; Hanael, R.; Levin, I.; Ricard, B.; Rothan, C.; ***Schaffer,*** *** A.A.*** ; Granot, D.
AVAILABILITY: DNAL (QK1.P5)
SOURCE: Plant science, Sept 2002. Vol. 163, No. 3. p. 581-590
Publisher: Oxford, UK : Elsevier Science Ltd.
CODEN: PLSCE4; ISSN: 0168-9452
NOTE: Includes references
PUB. COUNTRY: Ireland
DOCUMENT TYPE: Article
FILE SEGMENT: Non-U.S. Imprint other than FAO
LANGUAGE: English

L4 ANSWER 7 OF 33 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 5
ACCESSION NUMBER: 2002:39732 AGRICOLA
DOCUMENT NUMBER: IND23273288

tomato fruits, is not required for starch biosynthesis in developing fruits.
AUTHOR(S): Dai, N.; German, M.A.; Matsevitz, T.; Hanael, R.; Swartzberg, D.; Yeselson, Y.; Petreikov, M.; ***Schaffer, A.A.*** ; Granot, D.
AVAILABILITY: DNAL (QK1.P5)
SOURCE: Plant science, Mar 2002. Vol. 162, No. 3. p. 423-430
Publisher: Oxford, UK : Elsevier Science Ltd.
CODEN: PLSCE4; ISSN: 0168-9452
NOTE: Includes references
PUB. COUNTRY: Ireland
DOCUMENT TYPE: Article
FILE SEGMENT: Non-U.S. Imprint other than FAO
LANGUAGE: English

L4 ANSWER 8 OF 33 CABA COPYRIGHT 2004 CABI on STN DUPLICATE 6
ACCESSION NUMBER: 2002:142983 CABA
DOCUMENT NUMBER: 20023080828
TITLE: Sucrose uptake, invertase localization and gene expression in developing fruit of ***Lycopersicon*** esculentum and the sucrose-accumulating ***Lycopersicon*** hirsutum
AUTHOR: Miron, D.; Petreikov, M.; Nir Carmi; Shmuel Shen; Ilan Levin; David Granot; Zamski, E.; ***Schaffer,*** A. A.***
CORPORATE SOURCE: Institute of Field and Garden Crops, Volcani Center, Bet Dagan, 50250, Israel. arnoamya@netvision.net
SOURCE: Physiologia Plantarum, (2002) Vol. 115, No. 1, pp. 35-47. 47 ref.
Publisher: Blackwell Publishing. Oxford
ISSN: 0031-9317
PUB. COUNTRY: United Kingdom
DOCUMENT TYPE: Journal
LANGUAGE: English
ENTRY DATE: Entered STN: 20020905
Last Updated on STN: 20020905
AB Using immunolocalization and differential extraction methods, we showed that only apoplastic invertase, but not vacuolar invertase, was present in the mature, sucrose-accumulating L. hirsutum cv. LA 1777 pericarp. In contrast, in the hexose-accumulating L. esculentum cv. BR-124 fruit, both the apoplastic and vacuolar invertase activities and protein content increased in the mature fruit. Quantitative expression studies of the soluble invertase gene (TIV1) and the apoplastic invertase genes (LINs) showed that only TIV1 gene expression could account for the species and developmental differences of both soluble and insoluble enzyme activity of the pericarp. The expression of the LIN genes encoding for apoplastic ***tomato*** invertases was unrelated to the differences in bound enzyme activity and could not account for the rise in bound invertase activity in the mature L. esculentum fruit. Evidence is presented that the bound invertase activity of ***tomato*** fruit is also the TIV1 gene product. The presence of apoplastic invertase in the mature sucrose-accumulating L. hirsutum fruit suggests a hydrolysis-resynthesis mechanism of sucrose uptake. To test this hypothesis, we studied short- and long-term uptakes of asymmetrically labelled 3H-fructosyl-sucrose accompanied by compartmental analysis of the sugars in attached whole fruits of L. hirsutum and L. esculentum. The results indicate that hydrolysis-resynthesis is slow in the sucrose-accumulating fruit but is not an integral part of an uptake and compartmentation mechanism.

L4 ANSWER 9 OF 33 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 7
ACCESSION NUMBER: 2002:39351 AGRICOLA
DOCUMENT NUMBER: IND23272486
TITLE: Characterization of native and yeast-expressed ***tomato*** fruit fructokinase enzymes.
AUTHOR(S): Petreikov, M.; Dai, N.; Granot, D.; ***Schaffer,*** A.A.***
AVAILABILITY: DNAL (450 P5622)
SOURCE: Phytochemistry, Nov 2001. Vol. 58, No. 6. p. 841-847
Publisher: Oxford : Elsevier Science Ltd.
CODEN: PYTCAS; ISSN: 0031-9422
NOTE: Includes references
PUB. COUNTRY: England; United Kingdom
DOCUMENT TYPE: Article

LANGUAGE: English
AB Three fructokinase isozymes (FKI, FKII, FKIII) were separated from both immature and ripe ***tomato*** fruit pericarp. All three isozymes were specific for fructose with undetectable activity towards glucose or mannose. The three isozymes could be distinguished from one another with respect to response to fructose, Mg and nucleotide donor concentrations and this allowed the comparison of the fruit enzymes with the gene products of the two known cloned ***tomato*** fructokinase genes, LeFRK1 and LeFRK2. FKI was characterized by both substrate (fructose), as well as Mg, inhibition; FKII was inhibited by neither fructose nor Mg; and FKIII was inhibited by fructose but not by Mg. ATP was the preferred nucleotide donor for all three FKs and FKI showed inhibition by CTP and GTP above 1 mM. All three FKs showed competitive inhibition by ADP. During the maturation of the ***tomato*** fruit total FK activity decreased dramatically. There were decreases in activity of all three FKs, nevertheless, all were still observed in the ripe fruit. The two ***tomato*** LeFRK genes were expressed in yeast and the gene products were characterized with respect to the distinguishing characteristics of fructose, Mg and nucleotide inhibition. Our results indicate that FKI is the gene product of LeFRK2 and FKII is probably the gene product of LeFRK1.

L4 ANSWER 10 OF 33 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 8
ACCESSION NUMBER: 2001:33462 AGRICOLA
DOCUMENT NUMBER: IND22437308
TITLE: Cloning and characterization of a cDNA encoding hexokinase from ***tomato*** .
AUTHOR(S): Menu, T.; Rothan, C.; Dai, N.; Petreikov, M.; Etienne, C.; Destrac-Irvine, A.; ***Schaffer, A.*** ; Granot, D.; Ricard, B.
AVAILABILITY: DNAL (QK1.P5)
SOURCE: Plant science, Jan 5, 2001. Vol. 160, No. 2. p. 209-218
Publisher: Oxford, UK : Elsevier Science Ltd.
CODEN: PLSCE4; ISSN: 0168-9452
NOTE: Includes references
PUB. COUNTRY: Ireland
DOCUMENT TYPE: Article
FILE SEGMENT: Non-U.S. Imprint other than FAO
LANGUAGE: English

L4 ANSWER 11 OF 33 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 9
ACCESSION NUMBER: 2000:71709 AGRICOLA
DOCUMENT NUMBER: IND22072221
TITLE: Fgr, a major locus that modulates the fruit to glucose ratio in mature ***tomato*** fruits.
AUTHOR(S): Levin, I.; Gilboa, N.; Yeselson, E.; Shen, S.; ***Schaffer, A.A.***
AVAILABILITY: DNAL (442.8 Z8)
SOURCE: Theoretical and applied genetics, Jan 2000. Vol. 100, No. 2. p. 256-262
Publisher: Berlin; Springer-Verlag
CODEN: THAGA6; ISSN: 0040-5752
NOTE: Includes references
PUB. COUNTRY: West Berlin
DOCUMENT TYPE: Article
FILE SEGMENT: Non-U.S. Imprint other than FAO
LANGUAGE: English
AB A genetic trait determining the ratio of fructose to glucose in mature ***tomato*** fruits is described. A backcross breeding program based on the interspecific cross of ***Lycopersicon*** hirsutum and L. esculentum yielded stable genotypes with a high ratio of fructose to glucose (>1.5:1) compared with the approximately equimolar ratios found in L esculentum. Two inter-simplesequence repeat (ISSR) DNA sequences, highly associated (20 <LOD score <21) with the trait, were identified. The markers were found to be less associated with either glucose or fructose levels individually (2 <LOD score <3) and were statistically unlinked to total sugars and total soluble solids (TSS). These two ISSR bands segregated in a dominant fashion and were found to be allelic to each other, one associated in coupling and the other in repulsion with the

the centromeric region of ***tomato*** chromosome 4. Quantitative analysis of the identified locus, based on data from segregating F2, BC and F3 populations from the cross between genotypes having high and low fructose to glucose ratios, suggested that the L. hirsutum-derived allele (FgrH), which increases the fructose to glucose ratio, is partially dominant. FgrH leads to an increase in fructose levels and a subsequent decrease in glucose levels, with no effect on total hexose levels. Accordingly, we conclude that the Fgr locus modulates the partitioning of hexose sugars between fructose and glucose, with no effect on total sugars or TSS.

L4 ANSWER 12 OF 33 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 10

ACCESSION NUMBER: 2000:37458 AGRICOLA
DOCUMENT NUMBER: IND22048787
TITLE: ADPglucose pyrophosphorylase activity and starch accumulation in immature ***tomato*** fruit: the effect of a ***Lycopersicon*** hirsutum-derived introgression encoding for the large subunit.
AUTHOR(S): ***Schaffer, A.A.*** ; Levin, I.; Oguz, I.; Petreikov, M.; Cincarevsky, F.; Yeselson, Y.; Shen, S.; Gilboa, N.; Bar, M.
CORPORATE SOURCE: Agricultural Research Organization, Bet Dagan, Israel.
AVAILABILITY: DNAL (QK1.P5)
SOURCE: Plant science, Mar 21, 2000. Vol. 152, No. 2. p. 135-144
Publisher: Oxford, UK : Elsevier Science Ltd.
CODEN: PLSCE4; ISSN: 0168-9452
NOTE: Includes references
PUB. COUNTRY: Ireland
DOCUMENT TYPE: Article
FILE SEGMENT: Non-U.S. Imprint other than FAO
LANGUAGE: English

L4 ANSWER 13 OF 33 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 11

ACCESSION NUMBER: 2000:22656 AGRICOLA
DOCUMENT NUMBER: IND22027130
TITLE: Overexpression of arabidopsis hexokinase in ***tomato*** plants inhibits growth, reduces photosynthesis, and induces rapid senescence.
AUTHOR(S): Dai, N.; ***Schaffer, A.*** ; Petreikov, M.; Shahak, Y.; Giller, Y.; Ratner, K.; Levine, A.; Granot, D.
CORPORATE SOURCE: Volcani Center, Bet Dagan, Israel.
AVAILABILITY: DNAL (QK725.P532)
SOURCE: The Plant cell, July 1999. Vol. 11, No. 7. p. 1253-1266
Publisher: [Rockville, MD : American Society of Plant Physiologists, c1989-
CODEN: PLCEEW; ISSN: 1040-4651
NOTE: Includes references
PUB. COUNTRY: Maryland; United States
DOCUMENT TYPE: Article
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English
AB Sugars are key regulatory molecules that affect diverse processes in higher plants. Hexokinase is the first enzyme in hexose metabolism and may be a sugar sensor that mediates sugar regulation. We present evidence that hexokinase is involved in sensing endogenous levels of sugars in photosynthetic tissues and that it participates in the regulation of senescence, photosynthesis, and growth in seedlings as well as in mature plants. Transgenic ***tomato*** plants overexpressing the Arabidopsis hexokinase-encoding gene AtHXK1 were produced. Independent transgenic plants carrying single copies of AtHXK1 were characterized by growth inhibition, the degree of which was found to correlate directly to the expression and activity of AtHXK1. Reciprocal grafting experiments suggested that the inhibitory effect occurred when AtHXK1 was expressed in photosynthetic tissues. Accordingly, plants with increased AtHXK1 activity had reduced chlorophyll content in their leaves, reduced photosynthesis rates, and reduced photochemical quantum efficiency of photosystem II reaction centers compared with plants without increased AtHXK1 activity.

that hexokinase is also involved in senescence regulation. Fruit weight, starch content in young fruits, and total soluble solids in mature fruits were also reduced in the transgenic plants. The results indicate that endogenous hexokinase activity is not rate limiting for growth; rather, they support the role of hexokinase as a regulatory enzyme in photosynthetic tissues, in which it regulates photosynthesis, growth, and senescence.

L4 ANSWER 14 OF 33 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 12

ACCESSION NUMBER: 2000:9614 AGRICOLA
DOCUMENT NUMBER: IND22020409
TITLE: Modification of carbohydrate content in developing ***tomato*** fruit.
AUTHOR(S): ***Schaffer, A.A.*** ; Petreikov, M.; Miron, D.; Fogelman, M.; Spiegelman, M.; Bnei-Moshe, Z.; Shen, S.; Granot, D.; Hadas, R.; Dai, N.
CORPORATE SOURCE: Volcani Center, Bet Dagan, Israel.
AVAILABILITY: DNAL (SB1.H6)
SOURCE: HortScience : a publication of the American Society for Horticultural Science, Oct 1999. Vol. 34, No. 6. p. 1024-1027
Publisher: Alexandria, Va. : The American Society for Horticultural Science.
CODEN: HJHSAR; ISSN: 0018-5345
NOTE: Paper presented at the colloquium "The carbohydrate economy of horticultural crops" held July 25, 1997, Salt Lake City, Utah.
Includes references
PUB. COUNTRY: United States; Virginia
DOCUMENT TYPE: Article; Law
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English

L4 ANSWER 15 OF 33 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN

ACCESSION NUMBER: 2002:128000 BIOSIS
DOCUMENT NUMBER: PREV200200128000
TITLE: Method for breeding tomatoes with superior taste characteristics and product of the method.
AUTHOR(S): ***Schaffer, A.*** [Inventor]
CORPORATE SOURCE: Hashmonaim, Israel
ASSIGNEE: PERI DEVELOPMENT APPLICATIONS, LTD.
PATENT INFORMATION: US 5817913 Oct. 6, 1998
SOURCE: Official Gazette of the United States Patent and Trademark Office Patents, (Oct. 6, 1998) Vol. 1215, No. 1, pp. 671-672. print.
CODEN: OGUPE7. ISSN: 0098-1133.
DOCUMENT TYPE: Patent
LANGUAGE: English
ENTRY DATE: Entered STN: 30 Jan 2002
Last Updated on STN: 26 Feb 2002

L4 ANSWER 16 OF 33 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 13

ACCESSION NUMBER: 1999:8962 AGRICOLA
DOCUMENT NUMBER: IND21961377
TITLE: ***Tomato*** fructokinases exhibit differential expression and substrate regulation.
AUTHOR(S): Kanayama, Y.; Granot, D.; Dai, N.; Petreikov, M.; ***Schaffer, A.*** ; Powell, A.; Bennett, A.B.
CORPORATE SOURCE: Univeristy of California, California, Davis, CA.
AVAILABILITY: DNAL (450 P692)
SOURCE: Plant physiology, May 1998. Vol. 117, No. 1. p. 85-90
Publisher: Rockville, MD : American Society of Plant Physiologists, 1926-
CODEN: PLPHAY; ISSN: 0032-0889
NOTE: Includes references
PUB. COUNTRY: Maryland; United States
DOCUMENT TYPE: Article; Conference
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English
AB Two divergent genes encoding fructokinase, Frk1 and Frk2, have been

esculentum L.) and have now been further characterized with regard to their spatial expression and the enzymic properties of the encoded proteins. Frk1 and Frk2 mRNA levels were coordinately induced by exogenous sugar, indicating that both belong to the growing class of sugar-regulated genes. However, in situ hybridization indicated that Frk1 and Frk2 were expressed in a spatially distinct manner, with Frk2 mRNA primarily localized in cells of the fruit pericarp, which store starch, and Frk1 mRNA distributed ubiquitously in pericarp tissue. To evaluate the biochemical characteristics of the products of the Frk1 and Frk2 genes, each cDNA was expressed in a mutant yeast (Saccharomyces cerevisiae) line defective in hexose phosphorylation and unable to grow on glucose or fructose (Fru). Both Frk1 and Frk2 proteins expressed in yeast conferred the ability to grow on Fru and exhibited fructokinase activity in vitro. Although both Frk1 and Frk2 both utilized Fru as a substrate, only Frk2 activity was inhibited at high Fru concentrations. These results indicate that Frk2 can be distinguished from Frk1 by its sensitivity to substrate inhibition and by its temporal and spatial pattern of expression, which suggests that it plays a primary role in plant cells specialized for starch storage.

L4 ANSWER 17 OF 33 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 14

ACCESSION NUMBER: 1998:1559 AGRICOLA
DOCUMENT NUMBER: IND20607707
TITLE: Divergent fructokinase genes are differentially expressed in ***tomato*** .
AUTHOR(S): Kanayama, Y.; Dai, N.; Granot, D.; Petreikov, M.; ***Schaffer, A.*** ; Bennett, A.B.
CORPORATE SOURCE: Tohoku University, Sendai, Japan.
SOURCE: Plant physiology, Apr 1997. Vol. 113, No. 4. p. 1379-1384
Publisher: Rockville, MD : American Society of Plant Physiologists, 1926-
CODEN: PLPHAY; ISSN: 0032-0889
NOTE: Includes references
PUB. COUNTRY: Maryland; United States
DOCUMENT TYPE: Article; Conference
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English

AB Two cDNA clones (Frk1 and Frk2) encoding fructokinase (EC 2.7.1.4) were isolated from ***tomato*** (***Lycopersicon*** esculentum). The Frk2 cDNA encoded a deduced protein of 328 amino acids that was more than 90% identical with a previously characterized potato (Solanum tuberosum) fructokinase. In contrast, the Frk1 cDNA encoded a deduced protein of 347 amino acids that shared only 55% amino acid identity with Frk2. Both deduced proteins possessed an ATP-binding motif and putative substrate recognition site sequences identified in bacterial fructokinases. The Frk1 cDNA was expressed in a mutant yeast (Saccharomyces cerevisiae) line, which lacks the ability to phosphorylate glucose and fructose and is unable to grow on glucose or fructose. Mutant cells expressing Frk1 were complemented to grow on fructose but not glucose, indicating that Frk1 phosphorylates fructose but not glucose, and this activity was verified in extracts of transformed yeast. The mRNA corresponding to Frk2 accumulated to high levels in young, developing ***tomato*** fruit, whereas the Frk1 mRNA accumulated to higher levels late in fruit development. The results indicate that fructokinase in ***tomato*** is encoded by two divergent genes, which exhibit a differential pattern of expression during fruit development.

L4 ANSWER 18 OF 33 CABA COPYRIGHT 2004 CABI on STN DUPLICATE 15

ACCESSION NUMBER: 1998:26410 CABA
DOCUMENT NUMBER: 19980301844
TITLE: Inhibition of fructokinase and sucrose synthase by cytosolic levels of fructose in young ***tomato*** fruit undergoing transient starch synthesis
AUTHOR: ***Schaffer, A. A.*** ; Petreikov, M.
CORPORATE SOURCE: Dept of Vegetable Crops, Volcani Center-ARO, 50250, Bet Dagan, Israel.
SOURCE: Physiologia Plantarum, (1997) Vol. 101, No. 4, pp. 800-806. 41 ref.
ISSN: 0031-9317
DOCUMENT TYPE: Journal
LANGUAGE: English
ENTRY DATE: Entered STN: 19980309

AB Compartmental analysis of immature ***tomato*** fruit pericarp showed that fructose was not specifically compartmentalized in the vacuole and that physiological cytosolic concentrations of fructose in young ***tomato*** fruit were above 30 mM. Such physiological levels of fructose significantly inhibited sucrose synthase (EC 2.4.1.13) cleavage activity as well as the activity of a partially purified fructokinase (EC 2.7.1.4). These data suggest a mechanism of a coordinated, in vivo regulation of ***tomato*** sucrose synthase and fructokinase activity, which may be potentially limiting to starch accumulation in young ***tomato*** fruit.

L4 ANSWER 19 OF 33 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 16

ACCESSION NUMBER: 97:74272 AGRICOLA
DOCUMENT NUMBER: IND20589779
TITLE: Sucrose-to-starch metabolism in ***tomato*** fruit undergoing transient starch accumulation.
AUTHOR(S): ***Schaffer, A.A.*** ; Petreikov, M.
CORPORATE SOURCE: Agricultural Research Organization, Bet Dagan, Israel.
SOURCE: Plant physiology, Mar 1997. Vol. 113, No. 3. p. 739-746
Publisher: Rockville, MD : American Society of Plant Physiologists, 1926-
CODEN: PLPHAY; ISSN: 0032-0889
NOTE: Includes references
PUB. COUNTRY: Maryland; United States
DOCUMENT TYPE: Article; Conference
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English
AB Immature green ***tomato*** (***Lycopersicon*** esculentum) fruits undergo a period of transient starch accumulation characterized by developmental changes in the activities of key enzymes in the sucrose (Suc)-to-starch metabolic pathway. Activities of Suc synthase, fructokinase, ADP-glucose (Glc) pyrophosphorylase, and soluble and insoluble starch synthases decline dramatically in parallel to the decrease in starch levels in the developing fruit. Comparison of "maximal" in vitro activities of the enzymes in the Suc-to-starch pathway suggests that these same enzymes are limiting to the rate of starch accumulation. In contrast, activities of invertase, UDP-Glc pyrophosphorylase, nucleoside diphosphate kinase, phosphoglucoisomerase, and phosphoglucomutase do not exhibit dramatic decreases in activity and appear to be in excess of starch accumulation rates. Starch accumulation is spatially localized in the inner and radial pericarp and columella, whereas the outer pericarp and seed locule contain little starch. The seed locule is characterized by lower activities of Suc synthase, UDP-Glc pyrophosphorylase, phosphoglucomutase, ADP-Glc pyrophosphorylase, and soluble and insoluble starch synthases. The outer pericarp exhibits comparatively lower activities of ADP-Glc pyrophosphorylase and insoluble starch synthase only. These data are discussed in terms of the developmental and tissue-specific coordinated control of Suc-to-starch metabolism.

L4 ANSWER 20 OF 33 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN

ACCESSION NUMBER: 1997:334245 BIOSIS
DOCUMENT NUMBER: PREV199799633448
TITLE: Modification of carbohydrate content in developing ***tomato*** fruit.
AUTHOR(S): ***Schaffer, Arthur A.*** ; Petreikov, Marina; Miron, Daphne; Fogelman, Miriam; Spiegelman, Moshe; Bnei-Moshe, Zecharia; Shen, Shmuel; Granot, David; Hadas, Rivka; Dai, Nir; Bar, Moshe; Friedman, Michael; Gilboa, Meir Pilowsky Nehama; Chen, Leah
CORPORATE SOURCE: Inst. Field Garden Crops, ARO-Volcani Cent., Jerusalem, Israel
SOURCE: Hortscience, (1997) Vol. 32, No. 3, pp. 551.
Meeting Info.: 94th Annual International Conference of the American Society for Horticultural Science. Salt Lake City, Utah, USA. July 23-26, 1997.
CODEN: HJHSAR. ISSN: 0018-5345.
DOCUMENT TYPE: Conference; (Meeting)
Conference; Abstract; (Meeting Abstract)
LANGUAGE: English
ENTRY DATE: Entered STN: 5 Aug 1997
Last Updated on STN: 5 Aug 1997

4 ANSWER 21 OF 33 CABA COPYRIGHT 2004 CABI on STN
CCESSION NUMBER: 96:97028 CABA
OCUMENT NUMBER: 19960706579
ITLE: Photoassimilate distribution in plants and crops: source-sink relationships
UTHOR: Zamski, E. [EDITOR]; ***Schaffer, A. A.*** ***
[EDITOR]***
ORPORATE SOURCE: Department of Agricultural Botany, Hebrew University of Jerusalem, Rehovot, Israel.
OURCE: Photoassimilate distribution in plants and crops: source-sink relationships, (1996) pp. xii + 905. ref. at ends of papers, Books in Soils, Plants and the Environment.
Publisher: Marcel Dekker Inc. New York
Price: $250
ISBN: 0-8247-9440-0
UB. COUNTRY: United States
OCUMENT TYPE: Book
ANGUAGE: English
NTRY DATE: Entered STN: 19960814
Last Updated on STN: 19960814
B This comprehensive textbook takes a broad, interdisciplinary approach to the study of photoassimilate partitioning and source sink relationships. The components of carbon partitioning are examined in detail including ecology, photosynthesis, loading, transport and anatomy. The impact of genetic, environmental and agrotechnological factors on whole-plant source sink physiology are also discussed. Thirty-seven chapters are arranged in 3 sections: physiological and metabolic aspects of the components of source-sink relationships (12 chapters); the integration of source-sink components (9); and whole-plant source sink relationships of selected crops (16). Crops discussed in detail include wheat, rice, maize, soyabeans, peas, sugarcane, carrots, sugarbeet, tomatoes, cucurbits, alfalfa, turfgrasses, Citrus, Prunus, grapes and roses.

4 ANSWER 22 OF 33 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN
CCESSION NUMBER: 97:65875 AGRICOLA
OCUMENT NUMBER: CAT10832822
ITLE: Sucrose metabolism in developing fruit of wild and cultivated ***Lycopersicon*** species.
UTHOR(S): Bennett, Alan B.; ***Schaffer, Arthur A.***
ORPORATE SOURCE: United States-Israel Binational Agricultural Research and Development Fund
VAILABILITY: DNAL (SB349.B46 1996)
OURCE: 1996 40 leaves : ill. ; 28 cm
Publisher: [Bet Dagan, Israel] : BARD, 1996.
OTE: Final report.
Project no. US-1872-90.
Includes bibliographical references.
UB. COUNTRY: Israel
OCUMENT TYPE: Bibliography; (MONOGRAPH)
ILE SEGMENT: Non-U.S. Imprint other than FAO
ANGUAGE: English

4 ANSWER 23 OF 33 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN
CCESSION NUMBER: 1997:92900 BIOSIS
OCUMENT NUMBER: PREV199799392103
ITLE: Biochemical mechanism of sucrose accumulation in ***Lycopersicon*** .
UTHOR(S): Miron, D. [Reprint author]; Izhar, S. [Reprint author]; ***Schaffer, A. A.*** [Reprint author]; Zamski, E.
ORPORATE SOURCE: Inst. Field Crops, ARO-Volcani Center, Bet Dagan, Israel
OURCE: Journal of Experimental Botany, (1996) Vol. 47, No. SPEC. ISSUE, pp. 1311.
Meeting Info.: International Conference on the Transport of Photoassimilates. Canterbury, England, UK. August 13-17, 1995.
CODEN: JEBOA6. ISSN: 0022-0957.
OCUMENT TYPE: Conference; (Meeting)
Conference; Abstract; (Meeting Abstract)
ANGUAGE: English
NTRY DATE: Entered STN: 3 Mar 1997
Last Updated on STN: 3 Mar 1997

ACCESSION NUMBER: 1997:92898 BIOSIS
DOCUMENT NUMBER: PREV199799392101
TITLE: Tissue localization of sucrose to starch metabolism in young ***tomato*** fruit.
AUTHOR(S): ***Schaffer, A. A.*** ; Petreikov, M.
CORPORATE SOURCE: Vegetable Crops, Volcani Centre-ARO, Bet Dagan, Israel
SOURCE: Journal of Experimental Botany, (1996) Vol. 47, No. SPEC. ISSUE, pp. 1310-1311.
Meeting Info.: International Conference on the Transport of Photoassimilates. Canterbury, England, UK. August 13-17, 1995.
CODEN: JEBOA6. ISSN: 0022-0957.
DOCUMENT TYPE: Conference; (Meeting)
Conference; Abstract; (Meeting Abstract)
LANGUAGE: English
ENTRY DATE: Entered STN: 3 Mar 1997
Last Updated on STN: 2 Apr 1997

L4 ANSWER 25 OF 33 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN
ACCESSION NUMBER: 1997:92897 BIOSIS
DOCUMENT NUMBER: PREV199799392100
TITLE: Cloning, expression and analysis of plant carbohydrate metabolism genes in yeast.
AUTHOR(S): Dai, N. [Reprint author]; Granot, D. [Reprint author]; ***Schaffer, A.*** ; Petreikov, M.
CORPORATE SOURCE: Field Crops Natural Resources, Inst. Field Garden Crops, Agric. Research Organization, Bet Dagan, Israel
SOURCE: Journal of Experimental Botany, (1996) Vol. 47, No. SPEC. ISSUE, pp. 1310.
Meeting Info.: International Conference on the Transport of Photoassimilates. Canterbury, England, UK. August 13-17, 1995.
CODEN: JEBOA6. ISSN: 0022-0957.
DOCUMENT TYPE: Conference; (Meeting)
Conference; Abstract; (Meeting Abstract)
LANGUAGE: English
ENTRY DATE: Entered STN: 3 Mar 1997
Last Updated on STN: 3 Mar 1997

L4 ANSWER 26 OF 33 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 17
ACCESSION NUMBER: 95:43853 AGRICOLA
DOCUMENT NUMBER: IND20468615
TITLE: PCR-generated molecular markers for the invertase gene and sucrose accumulation in ***tomato*** .
AUTHOR(S): Hadas, R.; ***Schaffer, A.*** ; Miron, D.; Fogelman, M.; Granot, D.
CORPORATE SOURCE: Agricultural Research Organization, The Volcani Center, Bet Dagan, Israel.
AVAILABILITY: DNAL (442.8 Z8)
SOURCE: Theoretical and applied genetics, June 1995. Vol. 90, No. 7/8. p. 1142-1148
Publisher: Berlin; Springer-Verlag
CODEN: THAGA6; ISSN: 0040-5752
NOTE: Includes references
PUB. COUNTRY: West Berlin
DOCUMENT TYPE: Article
FILE SEGMENT: Non-U.S. Imprint other than FAO
LANGUAGE: English
AB The green-fruited ***tomato*** species, ***Lycopersicon*** hirsutum, unlike the domesticated red-fruited species, L. esculentum, accumulates sucrose during the final stages of fruit development, concomitant with the loss of soluble acid invertase activity. In order to study the genetic linkage of sucrose accumulation to the invertase gene, part of the invertase gene from L. hirsutum was cloned, sequenced and the sequence compared with the invertase sequence of the red-fruited L. esculentum. Several base changes were found in the coding region of the two invertase genes. Based on these base-pair differences, we developed a species-specific PCR assay capable of determining, in a single PCR reaction, the origin of the invertase gene in segregating seedlings of an interspecific cross. Our results indicate that the invertase gene is genetically linked to sucrose accumulation in the green-fruited L. hirsutum.

ACCESSION NUMBER: 1993:402340 BIOSIS
DOCUMENT NUMBER: PREV199345061165
TITLE: Biochemistry of transient starch accumulation in young ***tomato*** fruit.
AUTHOR(S): ***Schaffer, Arthur A.*** ; Petreikov, Marina
CORPORATE SOURCE: Dep. Vegetable Crops, Volcani Cent., ARO, Bet Dagan, Israel
SOURCE: Plant Physiology (Rockville), (1993) Vol. 102, No. 1 SUPPL., pp. 28.
Meeting Info.: Joint Annual Meeting of the American Society of Plant Physiologists and the Canadian Society of Plant Physiologists (La Societe Canadienne de Physiologie Vegetale). Minneapolis, Minnesota, USA. July 31-August 4, 1993.
CODEN: PLPHAY. ISSN: 0032-0889.
DOCUMENT TYPE: Conference; (Meeting)
LANGUAGE: English
ENTRY DATE: Entered STN: 30 Aug 1993
Last Updated on STN: 31 Aug 1993

L4 ANSWER 28 OF 33 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN
ACCESSION NUMBER: 92:99916 AGRICOLA
DOCUMENT NUMBER: CAT92987415
TITLE: Sucrose metabolism in developing fruits of cultivated and wild ***Lycopersicon*** species.
AUTHOR(S): Bennett, Alan B.; ***Schaffer, Arthur A.***
CORPORATE SOURCE: United States-Israel Binational Agricultural Research and Development Fund
AVAILABILITY: DNAL (SB349.B47 1992)
SOURCE: 1992 19 leaves : ill. ; 28 cm
Publisher: Bet Dagan, Israel : BARD, 1992.
NOTE: Final report.
Project no. US-1321-87.
Includes bibliographical references (leaves 17-19).
PUB. COUNTRY: Israel
DOCUMENT TYPE: Bibliography; (MONOGRAPH)
FILE SEGMENT: Non-U.S. Imprint other than FAO
LANGUAGE: English

L4 ANSWER 29 OF 33 CABA COPYRIGHT 2004 CABI on STN DUPLICATE 18
ACCESSION NUMBER: 91:75941 CABA
DOCUMENT NUMBER: 19910305702
TITLE: Sucrose phosphate synthase, sucrose synthase, and invertase activities in developing fruit of ***Lycopersicon*** esculentum Mill. and the sucrose accumulating ***Lycopersicon*** hirsutum Humb. and Bonpl
AUTHOR: Miron, D.; ***Schaffer, A. A.***
CORPORATE SOURCE: Department of Vegetable Crops, Agricultural Research Organization, Volcani Center, Bet Dagan, 50250, Israel.
SOURCE: Plant Physiology, (1991) Vol. 95, No. 2, pp. 623-627. 26 ref.
ISSN: 0032-0889
DOCUMENT TYPE: Journal
LANGUAGE: English
ENTRY DATE: Entered STN: 19941101
Last Updated on STN: 19941101
AB The green-fruited L. hirsutum accumulated sucrose to concentrations of about 118 [micro]mol/g FW during the final stages of development. In comparison, L. esculentum cultivars contained less than 15 [micro]mol/g FW of sucrose at the ripe stage. Glucose and fructose levels remained relatively constant throughout development in L. hirsutum at 22-50 [micro]mol/g FW each. Starch content was low even at early stages of development, and declined further with development. Soluble acid invertase activity declined concomitant with the rise in sucrose content. Acid invertase activity, which was solubilized in 1 M NaCl (presumably cell-wall bound), remained constant throughout development (about 3 [micro]mol of reducing sugars g FW-1 h-1). Sucrose phosphate synthase activity was present at about 5 [micro]mol of sucrose g FW-1 h-1 even at early stages of development, and increased sharply to about 40 [micro]mol of sucrose g FW-1 h-1 at the final stages of development studied, parallel to the rise in sucrose content. In comparison, sucrose phosphate synthase activity in L. esculentum remained low throughout development. The

accumulation are discussed.

L4 ANSWER 30 OF 33 BIOSIS COPYRIGHT 2004 BIOLOGICAL ABSTRACTS INC. on STN
ACCESSION NUMBER: 1991:515178 BIOSIS
DOCUMENT NUMBER: PREV199141115893; BR41:115893
TITLE: INVOLVEMENT OF SUGARS IN THE MECHANISM OF HERBICIDE-INDUCED RESISTANCE.
AUTHOR(S): BLAIER B [Reprint author]; COHEN R; ***SCHAFFER A A*** ; KATAN J
CORPORATE SOURCE: DEP VEGETABLE CROPS, ARO, NEWE YA'AR EXP STN, HAIFA POST 31999, ISRAEL
SOURCE: Phytoparasitica, (1991) Vol. 19, No. 3, pp. 246-247.
Meeting Info.: SECOND ISRAELI-ITALIAN PHYTOPATHOLOGICAL SYMPOSIUM, BELGIRATE, ITALY, JULY 14-17, 1991.
PHYTOPARASITICA.
CODEN: PHPRA2. ISSN: 0334-2123.
DOCUMENT TYPE: Conference; (Meeting)
FILE SEGMENT: BR
LANGUAGE: ENGLISH
ENTRY DATE: Entered STN: 14 Nov 1991
Last Updated on STN: 14 Nov 1991

L4 ANSWER 31 OF 33 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN
ACCESSION NUMBER: 2004:9545 AGRICOLA
DOCUMENT NUMBER: IND43616884
TITLE: Suppression of fructokinase encoded by LeFRK2 in ***tomato*** stem inhibits growth and causes wilting of young leaves.
AUTHOR(S): German, M.A.; Dai, N.; Matsevitz, T.; Hanael, R.; Petreikov, M.; Bernstein, N.; Ioffe, M.; Shahak, Y.; ***Schaffer, A.A.*** ; Granot, D.
AVAILABILITY: DNAL (QK710.P68)
SOURCE: Plant journal, p. 837-846
ISSN: 0960-7412
NOTE: Includes references
DOCUMENT TYPE: Article
FILE SEGMENT: Non US
LANGUAGE: English
AB Fructokinases catalyze the key step of fructose phosphorylation in plants. LeFRK2, the major fructokinase-encoding gene in ***tomato*** plants, is abundantly expressed in roots, stems, and fruits. To analyze the role of LeFRK2 in plant development, we analyzed transgenic ***tomato*** plants with sense and antisense expression of StFRK, the potato homolog of LeFRK2. Increased fructokinase activity had no effect. However, plants in which LeFRK2 was specifically suppressed, either via antisense suppression or via co-suppression, exhibited growth inhibition and wilting of young leaves at daytime. Grafting experiments indicated that a stem interstock of antisense plants was sufficient to inhibit growth and cause leaf wilting. Stem secondary xylem exhibited particular suppression of LeFRK2 and the area of active xylem, estimated by eosin uptake, was significantly smaller in antisense stem compared to that of wild-type plants. These results suggest that LeFRK2 might be required for proper development of xylem that affected growth and wilting.

L4 ANSWER 32 OF 33 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN
ACCESSION NUMBER: 2004:11061 AGRICOLA
DOCUMENT NUMBER: IND43618495
TITLE: Cloning, expression and characterization of LeFRK3, the fourth ***tomato*** (***Lycopersicon*** esculentum Mill.) gene encoding fructokinase.
AUTHOR(S): German, M.A.; Asher, I.; Petreikov, M.; Dai, N.; ***Schaffer, A.A.*** ; Granot, D.
AVAILABILITY: DNAL (QK1.P5)
SOURCE: Plant science, p. 285-291
ISSN: 0168-9452
NOTE: Includes references
DOCUMENT TYPE: Article
FILE SEGMENT: Non US
LANGUAGE: English

ACCESSION NUMBER: 2004:7325 AGRICOLA
DOCUMENT NUMBER: IND43614445
TITLE: Cloning and functional expression of alkaline (alpha)-galactosidase from melon fruit: similarity to plant SIP proteins uncovers a novel family of plant glycosyl hydrolases.
AUTHOR(S): Carmi, N.; Zhang, G.; Petreikov, M.; Gao, Z.; Eyal, Y.; Granot, D.; ***Schaffer, A.A.***
AVAILABILITY: DNAL (QK710.P68)
SOURCE: Plant journal, p. 97-106
ISSN: 0960-7412
NOTE: Includes references
DOCUMENT TYPE: Article
FILE SEGMENT: Non US
LANGUAGE: English

AB Raffinose and stachyose are ubiquitous galactosyl-sucrose oligosaccharides in the plant kingdom which play major roles, second only to sucrose, in photoassimilate translocation and seed carbohydrate storage. These sugars are initially metabolised by (alpha)-galactosidases (alpha)-gal). We report the cloning and functional expression of the first genes, CmAGA1 and CmAGA2, encoding for plant (alpha)-gals with alkaline pH optima from melon fruit (Cucumis melo L.), a raffinose and stachyose translocating species. The alkaline (alpha)-gal genes show very high sequence homology with a family of undefined 'seed imbibition proteins' (SIPs) which are present in a wide range of plant families. In order to confirm the function of SIP proteins, a representative SIP gene, from ***tomato*** , was expressed and shown to have alkaline (alpha)-gal activity. Phylogenetic analysis based on amino acid sequences shows that the family of alkaline (alpha)-gals shares little homology with the known prokaryotic and eukaryotic (alpha)-gals of glycosyl hydrolase families 27 and 36, with the exception of two cross-family conserved sequences containing aspartates which probably function in the catalytic step. This previously uncharacterised, plant-specific (alpha)-gal family of glycosyl hydrolases, with optimal activity at neutral-alkaline pH likely functions in key processes of galactosyl-oligosaccharide metabolism, such as during seed germination and translocation of RFO photosynthate.

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